

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

## FINAL EXAM

TRIMESTER 3, 2015/2016 SESSION

**TSN 2201/TCE 2321 – COMPUTER NETWORKS**  
(All Sections / Groups)

02 JUNE 2016  
2:30 p.m – 4:30 p.m  
(2 Hours)

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### INSTRUCTIONS TO STUDENTS

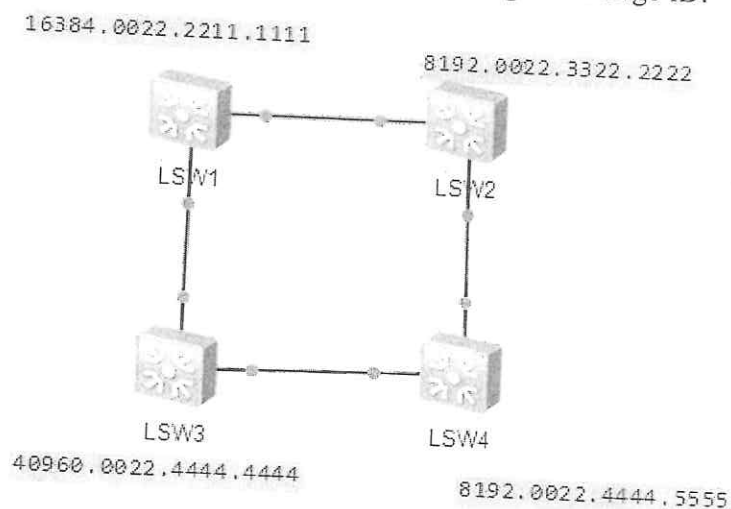
1. This Question paper consists of 5 printed pages including cover page with 6 questions only.
2. Attempt **FIVE** out of **SIX** questions. All questions carry equal marks and the distribution of marks for each question is given.
3. Please write all your answers in the Answer Booklet provided

**Question 1**

- (a) In a noisy channel, the bandwidth (BW) is 20000 Hz. The signal strength is 2 watt and the noise level is 0.05 watts.
- What is the maximum channel capacity? [2 marks]
  - The channel capacity is 50,000 bps. What is the BW if the channel is noiseless? [2 marks]
- (b) What is the SNR value if the channel is noiseless? [2 marks]
- (c) Give one example protocol which is *de facto* standard and one example of *de jure* standard. [2 marks]
- (d) Give two disadvantages of standardization to networking vendor. [2 marks]

**Question 2**

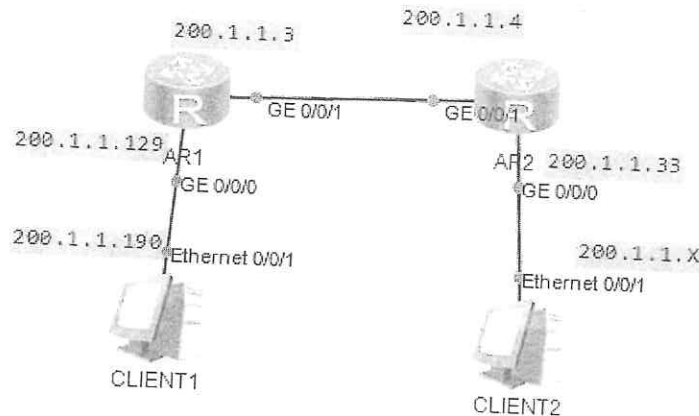
- (a) Below is a spanning tree network with the given Bridge ID.



- LSW2 is the root bridge. What are the steps required to ensure LSW4 become the root bridge assuming you cannot
- Shutdown any physical ports, bridge or rewiring.
  - You have no access to LSW4
- (b) In a bridged network, an engineer turned a bridge into a root bridge by changing its priority value to zero. He managed to do the same thing in 9 other networks except one CRAZY network. Despite setting the bridge priority to zero, the bridge in this CRAZY network remained a non-root bridge. Explain what was wrong with this CRAZY Network. [3 marks]
- (c) Give one difference between a bridge port and a switch port in connecting end stations. [1 mark]
- (d) Which layer of OSI model is responsible for compression? [1 mark]
- (e) Which layer of OSI model is responsible for encryption? [1 mark]
- (f) Give two differences between radio waves and microwaves. [2 marks]

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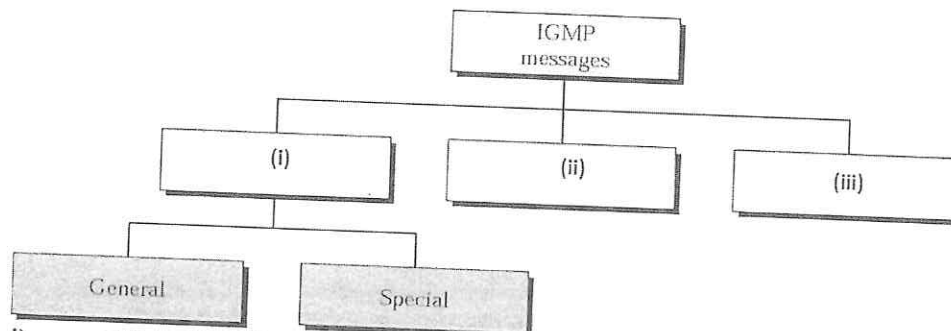
## Question 3



- Give two possible network-mask values for AR1 port GE 0/0/1. [2 marks]
- X is the last number in the subnet. What is the value of X? [2 marks]
- Give one difference between a static route and a default route. [2 marks]
- Give one difference between Port Address Translation (PAT) and Network Address Translation (NAT). [2 marks]
- What is the network mask for a host specific route? [1 mark]
- What is an Autonomous System (AS)? [1 mark]

## Question 4

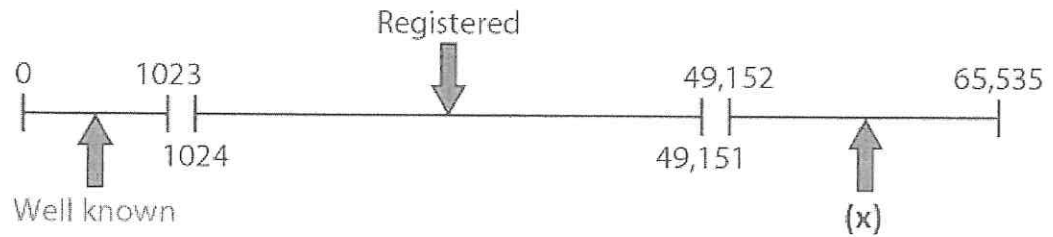
- The need for multicasting in the Internet has been increasing. But not all of the Internet are multicast routers.
  - Name a method to transmit multicast packets across networks with unicast routers. [1 mark]
  - Explain method (i) in brief. [1 mark]
- The following questions are related to Internet Group Management Protocol (IGMP).



- Fill in (i) – (iii). [3 marks]
  - Explain the function of (i). [1 mark]
- Why a membership report is sent twice in IGMP, one after another? [1 mark]
  - The IP packet that carries an IGMP packet has a value of 1 in its TTL field. Why? [1 mark]
  - Convert the multicast IP address 233.45.18.99 to an Ethernet multicast physical address. [2 marks]

**Question 5**

(a) The following is the IANA range for port numbers.

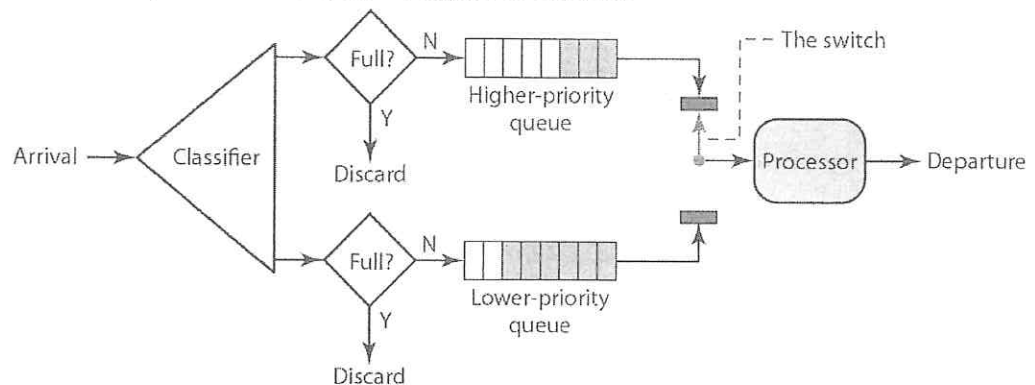


- i) Name the port range (x). [1 mark]
  - ii) Which processes can use ports in range (x)? [1 mark]
  - iii) Which port range is assigned and controlled by IANA? [1 mark]
- (b) Two identifiers are needed to form a socket address for a process-to-process delivery. Name these two identifiers. [2 marks]
- (c) The field value of the Header Length (HLEN) of a TCP segment can be from 5 to 15. What is the minimum and maximum size of the HLEN in bytes? [1 mark]
- (d) The following questions are related to flow control.
- i) Calculate the receiver window (rwnd) for computer X if Computer Y (the receiver) has
    - a buffer size of 5500 bytes and
    - 1800 bytes of received and unprocessed data? [1 mark]
  - ii) Continue from (i). What is the size of the window for computer X if the congestion window (cwnd) is 3000 bytes? [1 mark]
- (e) How error detection and correction in TCP can be achieved? One way is via checksum. Name the other two. [2 marks]

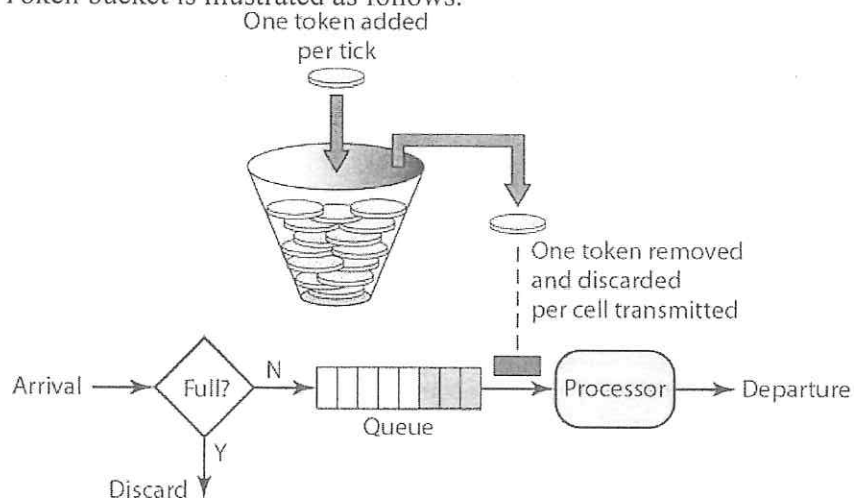
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### Question 6

(a) Answer the questions based on the figure as follows.



- i) Name this scheduling technique used in QoS. [1 mark]
  - ii) What is the function of the classifier? [1 mark]
  - iii) What will happen if the average arrival rate is higher than the average processing rate? [2 marks]
  - iv) How packets with different priority are processed? [2 marks]
- (b) Token bucket is illustrated as follows.



- i) What type of hosts are allowed to accumulate tokens for future transmission? [1 mark]
- ii) Under what circumstances a host is not allowed to send data. [1 mark]
- iii) What are the advantages of using token bucket as compared with leaky bucket? [2 marks]

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